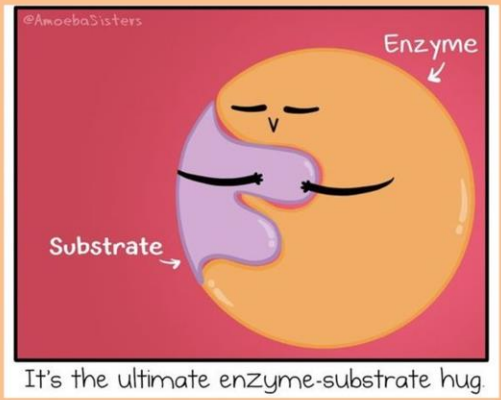
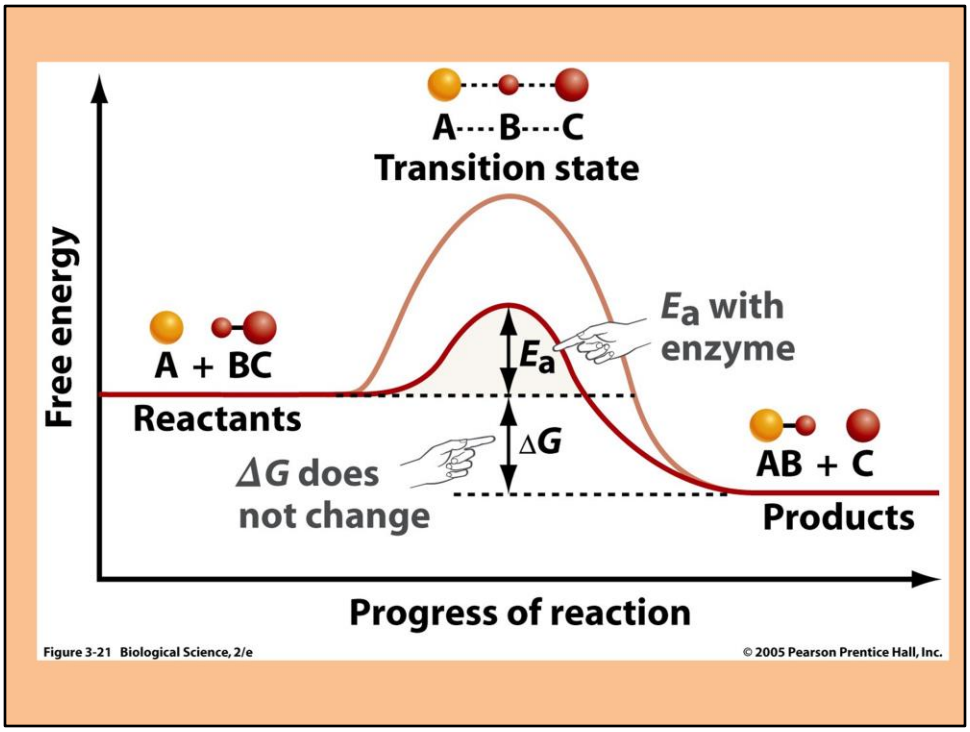
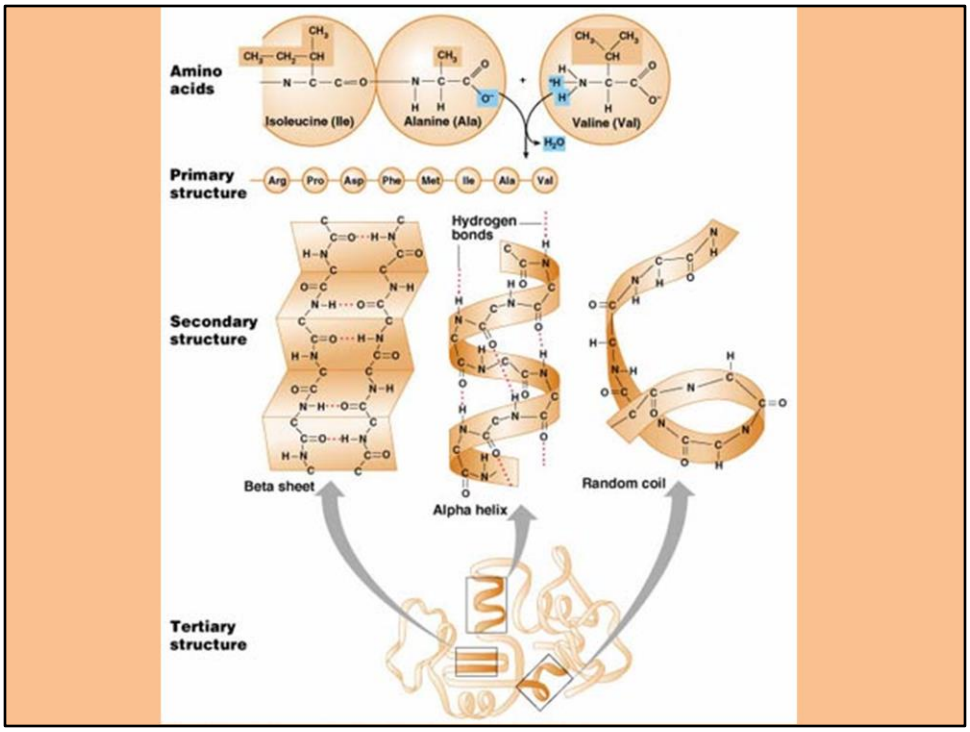
Enzymes


@AmoebaSisters
Enzyme
Substrate
It's the ultimate enzyme-substrate hug.



Enzymes DO change _____
_____

Enzymes DO NOT change _____
_____
_____



Primary structure: _____

_____

_____

_____

Secondary structure: _____

_____

_____

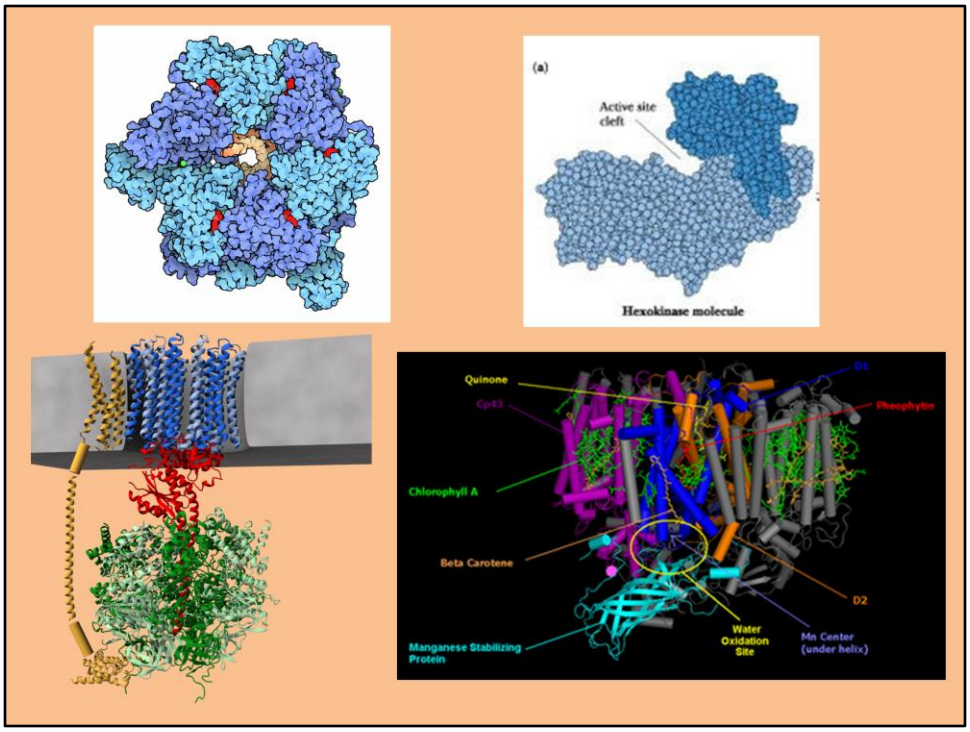
_____

Tertiary structure: _____

_____

_____

_____



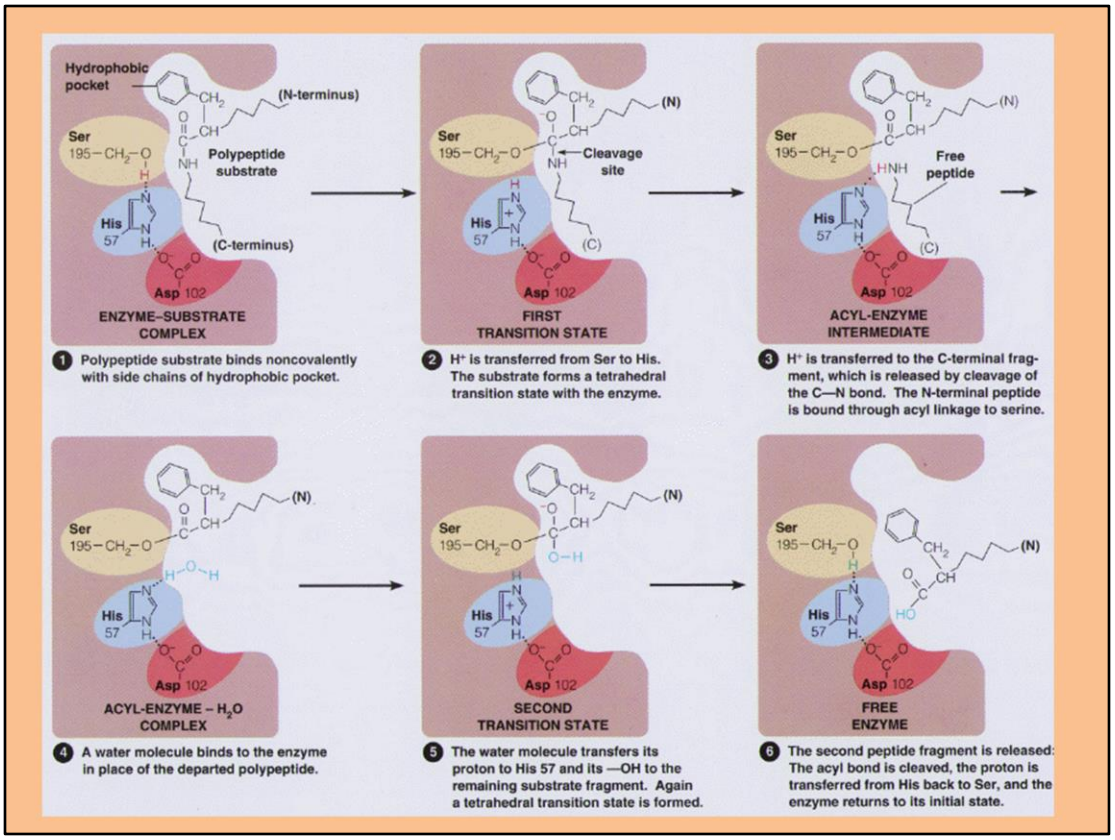
Overall structure of protein enzymes depend on bonds being held at specific places. This is determined by an enzymes:

_____

_____

_____

_____

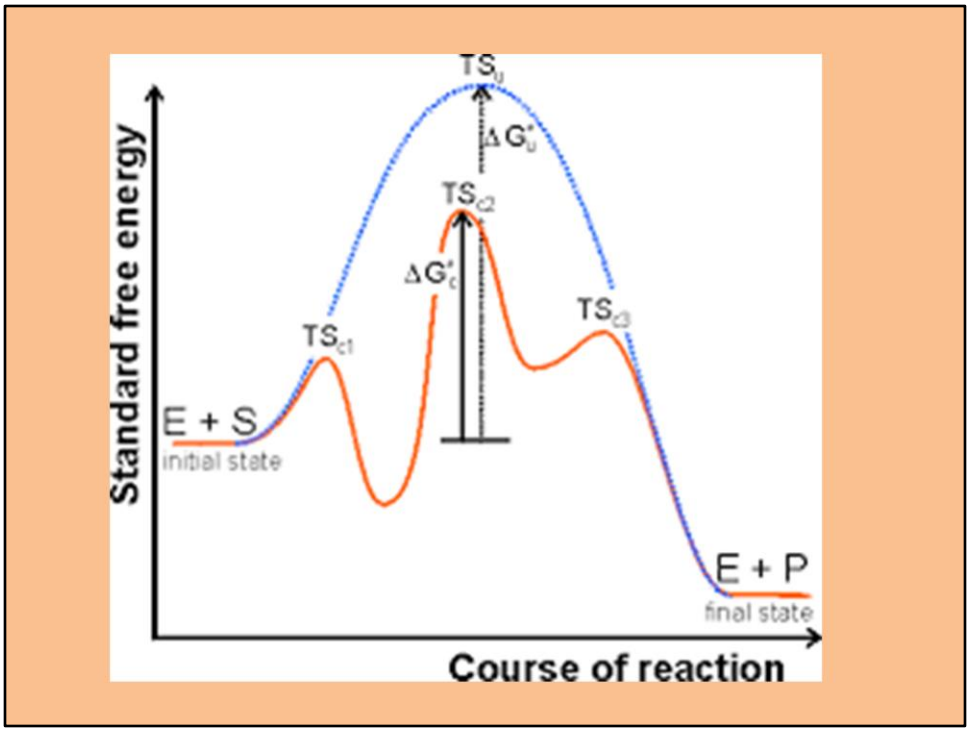


The Active Site & Mechanisms of Enzyme Action

1. Favorable initial binding interactions draw substrates in.
2. Unstable bonds formed, make likely to react (change).

The active site's catalytic properties are determined by its amino acids & their interactions with other nearby molecules.

Some enzymes are very specific, others very generic.



Reaction without enzyme takes longer because:

_____

_____

_____

_____

Enzymes lower Ea by: _____

_____

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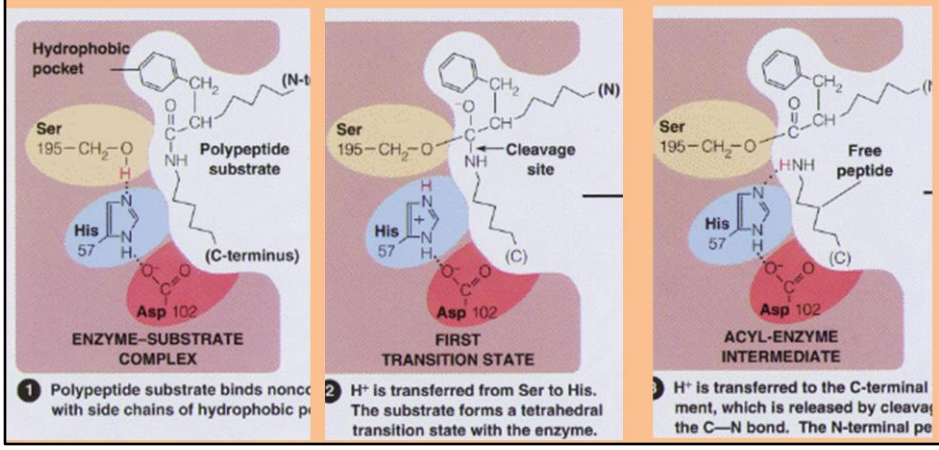
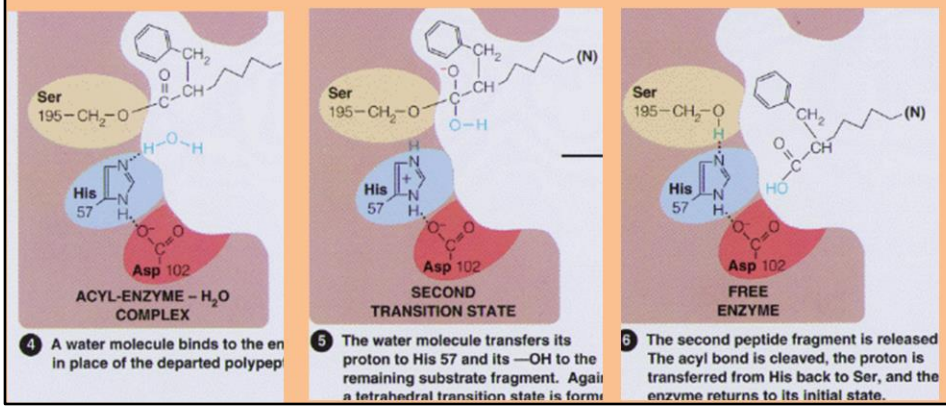
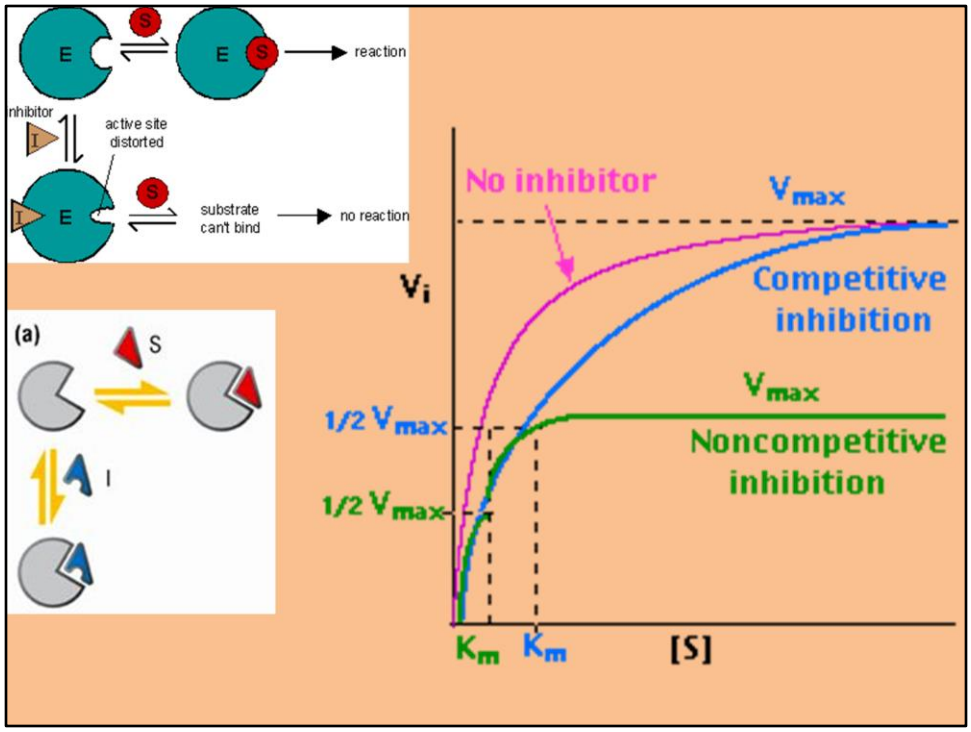
- **<u>High Temperature</u>**: deform hydrogen bond between Ser & His, enzyme denatures (Step 1).
- **<u>Bases</u>**: Selectively remove & add H+ to themselves. Cause H+ to transfer from Ser to itself rather than to His. Interferes with reaction rate (Step 2).



- **Salts**: Bond strongly to other charged atoms. In His + state (step 5) a salt could bind irreversibly, making enzyme nonfunctional.
- **Acids**: Release H+. Instead of His & Asp re-hydrogen bonding, released H+ from an acid could bond with O- on Asp, changing the active site shape & reactivity.





Competitive Inhibition: _____

_____

_____

_____

_____

_____

_____

Non- Competitive Inhibition: _____

_____

_____

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_____

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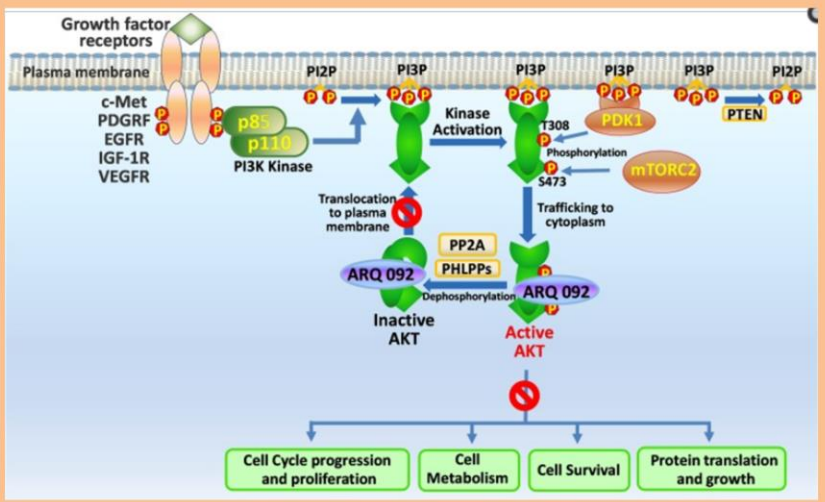
Allosteric inhibition to treat cancer cells: **Miransertib** experimental cancer medication allosterically inhibits specific active kinases without causing many other downstream effects (stimulating other processes also leading to cancer as with some other drugs).



Allosteric regulation in metabolism